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BUSINESS BASE ANALYSIS THE MISSING LINK

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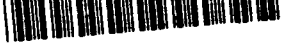
September 1993



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BUSINESS BASE ANALYSIS

THE MISSING LINK

In the development of cost estimates and program cost monitoring, the DoD cost analysis community must be aware of the impact of defense contractors capturing more commercial work and downsizing their operations. The equitable share of ovehead, increased unit costs due to cost/volume relationships and competition from a shrinking supplier base must be considered in projecting future costs. The business base analysis can serve as the link between current cost analysis techniques and specific contractor financial analysis to provide a more realistic cost estimate. The subject, Business Base Analysis, relates to the symposium theme by demonstrating how it can complement current cost estimating techniques in a changing, dynamic DoD business environment.

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	September 1993	ADODCAS 1993

4. TITLE AND SUBTITLE

Business Base Analysis - The Missing Link

5. FUNDING NUMBERS

6. AUTHOR(S)

James Tobias

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

US Army Tank - Automotive Command
Warren, Michigan 48397-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

Annual Department of Defense Cost Analysis Symposium Paper

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Statement A: Approved for Public Release; Distribution is Unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

See Over

14. SUBJECT TERMS

Business Base
Estimates

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
U	U	U	UL

BUSINESS BASE ANALYSIS THE MISSING LINK

INTRODUCTION

Cost and financial analysis of defense contractors is not enough to determine if a company is capable of delivering a service or product at a fair and reasonable price. In today's environment we need to do more than just run the numbers to determine the best offeror to successfully complete a government contract. The business base analysis can provide valuable information to link other analyses and assure we are getting best value at an equitable cost.

As the product mix of a company changes the indirect cost of their product will fluctuate.It is the anticipation of what per cent of their business will be government vs. commercial that can provide a more accurate estimate of the ultimate cost. A fair assessment of where the company sales volume is may assist in developing a more realistic cost estimate.

Defense contractors are desparately trying to capture sales/revenues of any kind. This attempt to strengthen their markets in Foreign Military Sales and commercial products has a direct effect on cost analysis of future and existing defense contracts.

COST ELEMENTS

It must be clear that such cost elements as Indirect Cost; General and Administrative Expense; Variable and Fixed Cost will be impacted by a change in product mix and volume.This will invariably impact a carefully predetermined cost that should be attained ie. a standard cost.

In developing the estimated standard cost the indirect cost,which is any cost not directly identified with a single cost objective or what a defense contractor refers to as an "Indirect Cost Pool", must be determined.The General and Administrative Expense or that cost of financial ,management, and other broad type of expense allocated to the business unit must be reviewed. The Variable Cost changes with the production quantity or the performance of services.The Fixed Cost is a cost which,for a given period of time and range of activity called the relevant range , does not change in total but becomes progressively smaller on a per-unit basis as volume increases.

COST / VOLUME

It becomes apparent that the predicted volume and product mix of a contractor can have a profound impact on the cost to the government for products or services. Although comparison of the above rates for varied contractors may not be fruitful, it may be useful to chart the trend of one contractor over time. This trend analysis would require adjustment for business base changes.

CONTRACTOR REVIEW

Cost analysts and/or program managers(PM's) and their staff are not involved in the day to day administration of contractor overhead or indirect cost.When prices are based on cost , however, the PM must understand the contractor's cost. Although the PM does not directly manage costs, they must encourage the contractor to be an aggressive cost manager. The category of Indirect Cost is not small or insignificant and should benefit from the disclosure a business base analysis provides.

UNALLOWABLE COST

Certain costs such as idle facility or idle capacity may be unallowable.It is the business base analysis that can provide insight to whether this may pose a problem or impact future cost. Cash flow represents the ultimate objective of a corporation ie. for cash inflows from customers to exceed cash outflows for expenses over the long run.Cash has time value and is not free to business. A business must earn it's cost of capital,ie cash, to remain viable over the long run. The business base analysis can help identify the capability of a contractor to utilize existing backlog and future opportunities to assure positive cash flow during the period of performance of the contract.

IMPORTANCE OF SALES

Nothing happens in business until there is a sale or the promise of a sale. All activity in a business is focused on generating revenues and the climate for capturing future sales to remain viable is critical. Potential markets are part of the business base analysis and provide an analysis of current and future market conditions.

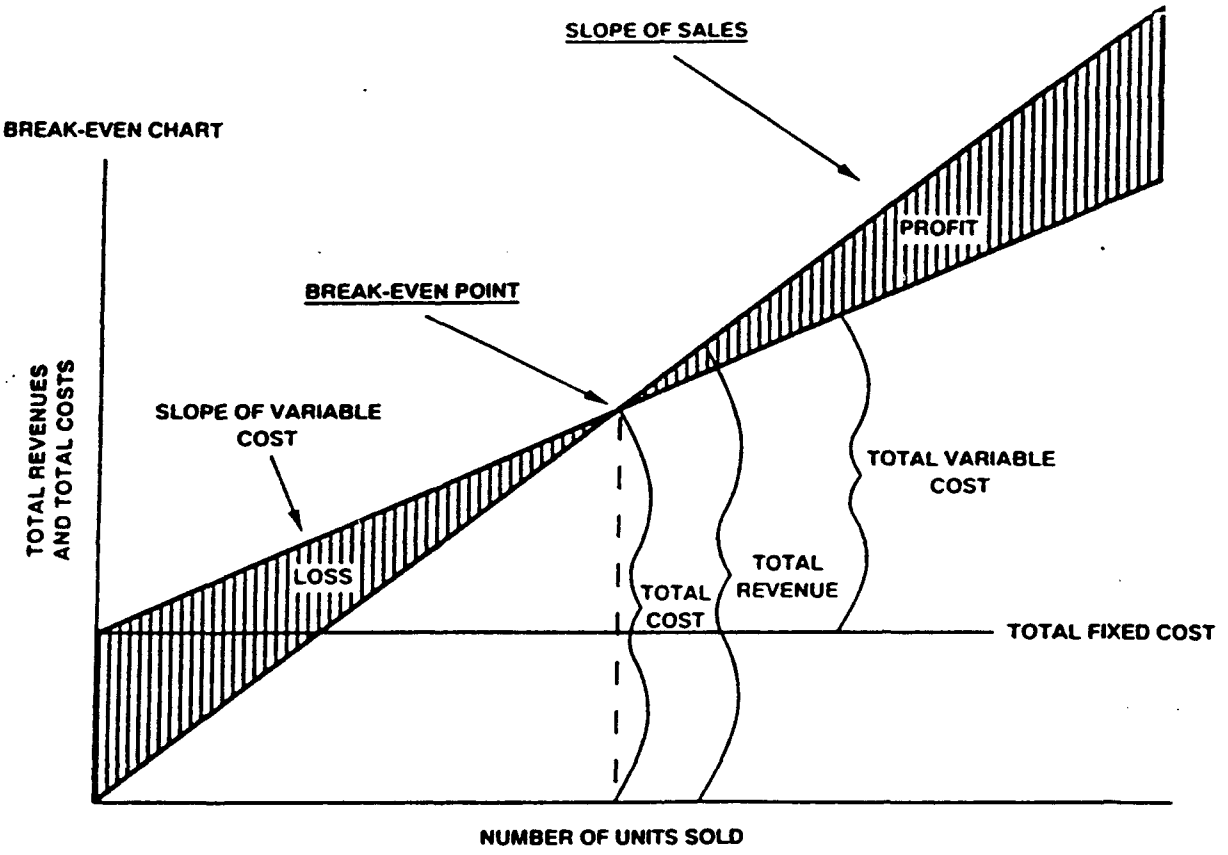
LEVERAGE

Lenders provide cash on a temporary basis to finance operations for business and the creditworthiness of the business is of importance. The ability to demonstrate a proven performance record as shown by the ability to diversify markets can enhance a company's ability to secure current financing for expansion and growth.It is via the business base analysis one can get an idea of the overall financial corporate health to again review commercial vs. government share of sales and income.

COST / VOLUME / PROFIT

The relationship between cost, volume, and profit can be demonstrated graphically.The following chart demonstrates the break-even point and shows how critical the volume is to the amount of profit a company makes to ensure it's future.

BREAK-EVEN CHART



Key relationship which result from the concept of cost behavior are listed below:

1. **The break-even point can be calculated algebraically in terms of units, sales dollars production capacity:**

$$\text{Break-even Quantity (In units)} = \frac{\text{Total Fixed Costs}}{\text{(Unit Price - Variable Cost Per Unit)}}$$

$$\text{Break-even Sales (In dollars)} = \text{Break-even Quantity} \times \text{Unit Price}$$

$$\text{Break-even Capacity (In percent)} = \frac{\text{Break-even Quantity}}{\text{Maximum Production Quantity}}$$

2. **At break-even:**

- **Total Revenue = Total Cost**
- **Total Revenue = Total Variable Cost + Total Fixed Cost**
- **Quantity Sold X Unit Price = Quantity Produced x Variable Cost Per Unit + Total Fixed Cost**
- **Profit = 0**

3. Contribution Margin:

- Contribution Margin Per Unit = Price per Unit minus Variable Cost Per Unit
- Total Contribution Margin = Total Revenue minus Total Variable Cost
- Profit = Total Contribution Margin minus Total Fixed Costs

BUSINESS TRENDS

The business base analysis will provide trends which can assist in assessing the potential cost growth due to reduced volume and or product-mix variations.Generally the base utilized for determining overhead rates is direct labor hours or direct labor dollars.With a cutback in volume the direct labor base normally shrink thus causing a higher overhead rate. This is caused by the fact that certain fixed and variable expenses (overhead) are ongoing regardless of volume. When the labor base is reduced at a proportionately higher rate than the aforementioned overhead the result is a much increased rate. This overhead rate which is applied to each direct labor dollar/hour can result in a significant increase in unit cost.The correct estimate of future volume can be the key to meeting or beating a program budget.

SUMMARY

As the defense industry continues to shrink the defense contractor is trying to capture commercial work that helps maintain the volumes necessary to keep the unit cost at a minimum.The question then becomes what equitable share of the cost of the company's operations should be allocated to the government contracts. This is where the business base analysis comes into play as a flag for an in-depth review of the correct absorption of cost to a particular program.The analysis will provide data on the sharing of faclities and equipment for similar government and commercial or foreign

military sales. Developing a cost estimate without this data will result in an estimate which overstates the governments fair share. There is never enough data input relevant to a cost estimate to consider as one develops a program cost.

BUSINESS BASE ANALYSIS FORMAT

The business base analysis is not a structured report but should as a minimum include an overall assessment of the future outlook of the contractor to include all revenue sources; backlog information;the various market segments to include a description of there capabilities;sales comparison by quarter for each segment;and general background information which will provide historical and industry data to factor into an cost estimate.

An example of a business base analysis is attached.

FMC BUSINESS BASE

FMC is a leading producer of chemicals and machinery for industry, agriculture and government. Incorporated in 1928, the company operates 95 manufacturing facilities and mines in 18 countries and 24 states in selected segments of five broad markets: Industrial Chemicals, Performance Chemicals, Precious Metals, Defense Systems, Machinery and Equipment. Defense systems are designed and produced in cooperation with the U.S. Armed Forces, equipment includes combat vehicles for personnel and cargo transport, and naval automatic gun mounts and guided missile launching systems. Specialized facilities produce high-quality carbon steel castings and forging.

FMC BUSINESS ANALYSIS

By most financial observers, the company is having a good year in 1992 considering the sluggish defense markets that it serves. In a recent filing with the Securities and Exchange Commission, General Dynamics indicated its intention to form a joint venture with an unidentified company, widely believed to be FMC, that would include both companies armored vehicle divisions. FMC and GD are partners in developing a common chassis for future military land vehicles. The potential for the elimination of duplicate facilities and overhead suggests that such a combination would be a net plus for both companies.

Defense Systems sales of $268 million increased 7 percent in the first quarter, ended March 31, 1992, and profits rose substantially. Sales improved on higher deliveries of the Bradley Fighting Vehicle and Multiple Launch Rocket System, partially offset by lower deliveries of the M113 armored personnel carrier. First quarter results also benefited from royalties and technology fees associated with international units.

Defense Systems sales of $279 million fell 10 percent and profits declined in the second quarter, ended June 30, 1992, due to lower international deliveries of the M113 armored personnel carrier. Second quarter results include an $8 million dividend from FMC's joint venture in turkey to produce armored fighting vehicles for the Turkish Army. In June 1992, FMC was awarded a $119 million contract to begin work on the U.S. Army's new generation of the Armored Gun System.

For the first half of 1992, Defense System sales of $547 million were $12 million lower than the first half of 1991, while profits were relatively flat. Backlog for the segment stood at $1.7 billion at the end of the period, down 26% from the year-ago period, primarily due to the 1991 receipt of the Bradley multi-year contract.

FMC OUTLOOK: The Defense Systems.

The outlook for FMC in 1992 and beyond "is somewhat pessimistic" as the company confronts a weak global economy and declining profitability from the international defense businesses. FMC strategy is to maintain a significant defense research capability in areas that are critical to developing the next generation of combat tracked vehicles.

Late in 1992, FMC will complete its U.S. contract for production of the M113 vehicle. The company was the sole source recipient of a $67 million U.S. Army contract for developmental work on the Advanced Field Artillery System (AFAS). FMC Naval Systems business will conduct much of the engineering work on the project. The initial developmental work on AFAS, a self-propelled howitzer with long distance firepower, could lead to as much as $4 billion in production contracts at the turn of the century.

Derivatives of the Bradley are another key factor in future production. FMC is in the midst of an engineering contract for the Electronic Fighting Vehicle System that could result in full scale production by the mid - to - late 1990's. Also in the development stage are the Fire integration Support Team Vehicle, which will locate targets for other weapon systems, and the Line-of-Sight Anti-Tank System. LOSAT production could begin by 1998.

In January 1992, FMC won a $56 million contract to produce 28 Vertical Launching System Modules for the U.S. Navy, with deliveries extending from 1994 through 1995. Also four Vertical Launching System modules were delivered to Japan and increased production is possible. Work continues on multi-year contracts for Mk13 guided launching systems for Taiwan and Spain. Production of the Mk45 gun has begun and deliveries for the U.S. Navy, Greece, Turkey, Thailand, Australia, and New Zealand is scheduled for 1992 through 1995.

FMC is the world's largest producer of cast and forged track for military vehicles and is in its fourth year of a five year contract as a prime supplier of track for the Army's M1 tank. To offset the decline in U.S. Army business, the company has stepped up commercial marketing efforts.

With the scaled-back defense industry, FMC's defense Systems will be smaller. Sales and earnings will be down in 1992, with diminished production of the M113 vehicle and the wind down of the Pakistan program. In 1993, production of the Bradley Fighting Vehicle will be 1.4 units per day from 2.6 per day. Projected cuts have gradually reduced the workforce since 1991 and will continue through 1994. Value line concludes that the appreciation potential of FMC stock to 1995 - 1997 is at least as attractive as that of the average equity.

SALES SUMMARY BY INDUSTRY SEGMENT (Dollars in millions)
FIRST QUARTER 1992 COMPARED TO FIRST QUARTER 1991

	Three Months Ended March 31		Percent
	1992	1991	Change
Industrial Chemicals	$248.2	$247.1	-
Performance Chemicals	$186 .8	$157.5	+19%
Precious Metals	$ 44.9	$ 34.6	+30%
Defense Systems	$268.3	$250.6	+7%
Machinery and Equipment	$187.4	$188.3	-
	$932.2	$876.7	+6%

SALES SUMMARY BY INDUSTRY SEGMENT (Dollars in millions)
SECOND QUARTER 1992 COMPARED TO SECOND QUARTER 1991

	Three Months Ended June 30		Percent
	1992	1991	Change
Industrial Chemicals	$254.9	$254.3	-
Performance Chemicals	$248.6	$204.3	+22%
Precious Metals	$ 42.4	$ 37.4	+14%
Defense Systems	$278.5	$308.1	-10%
Machinery and Equipment	$239.5	$244.3	-2%
	$1,058.3	$1,044.8	+1%

Performance Chemicals and Precious Metals were offset by the expected decline at Defense Systems.

SALES SUMMARY BY INDUSTRY SEGMENT (Dollars in millions)
Six months 1992 compared to six months 1991

	1992	1991	Percent Change
Industrial Chemicals	$503.1	$501.4	-
Performance Chemicals	$435.4	$361.8	+20%
Precious Metals	$ 87.4	$ 72.0	+21%
Defense Systems	$546.7	$558.7	-2%
Machinery and Equipment	$426.9	$432.6	-1%
	$1,990.5	$1921.5	+4%

SALES SUMMARY BY INDUSTRY SEGMENT (Dollars in millions)
1991 SALES AND OPERATING PROFITS

	SALES	PROFITS
Industrial Chemicals	26%	23%
Performance Chemicals	17%	23%
Precious Metals	4%	7%
Defense Systems	30%	37%
Machinery and Equipment	23%	10%

DEFENSE SYSTEMS	Description	Markets Served
Ground Systems Division	Produces tracked U.S. military vehicles for Army and allied governments.	U.S. Army, Marine Corps and National Guard; allied governments.
Naval Systems Division	Manufactures naval gun and launching systems for the U.S. and allied navies.	U.S. Navy, allied governments
Defense Systems International Division	Marketing and manufacturing arm for military products outside the United States.	International governments
Steel Products Division	Produces steel track, forging and castings.	Military and commercial buyers

DEFENSE SYSTEMS	MARKET POSITION	FMC Strengths
Ground Systems Division	Sole source on major programs	Advanced applications technology. Strong manufacturing capabilities. Proven products.
Naval Systems Division	Sole or dual source on major programs	Advanced applications technology. Strong manufacturing capabilities. Proven products.
International Division	A worldwide leader in product areas	Leading technology. Proven deal structuring.
Steel Products Division	40 percent of U.S.Strong military track market	Strong manufacturing capabilities.

Ground System Division:- Facing a declining demand from U.S. Army. Downsizing operation. Focusing R&D efforts.

Naval Systems Division:- Adjusting to a shrinking federal defense budget. Pursuing international opportunities.

International Division:- Aggressively pursuing international Opportunities.

Steel Product Division:- Developing more commercial business.

In 1991, research and development expenditures for the year fell to $135 million. Defense Systems results will probably decline as the company completes several significant international contracts. The Bradley Fighting Vehicles ensures production through 1994.

DEFENSE SYSTEMS	DESCRIPTION	MARKETS SERVED
GROUND SYSTEMS	Produces tracked military DIVISIONvehicles for U.S. Army and allied governments.	U.S. Army, Marine Corps and National Guard; allied governments.
NAVAL SYSTEMS DIVISION	Manufactures naval gun and launching systems for the U.S. and allied navies.	U.S. Navy, allied governments.
DEFENSE SYSTEMS INTERNATIONAL DIVISION	Marketing and manufacturing arm for military products outside the United States.	International governments.
STEEL PRODUCT DIVISION	Produces steel track, forgings and castings.	Military and commercial buyers. 40 percent of U.S. military track market

DEFENSE SYSTEMS	OUTLOOK
GROUND SYSTEMS DIVISION	Facing a declining demand from U.S. Army. Downsizing operation. Focusing R&D efforts.
NAVAL SYSTEMS DIVISION	Adjusting to a shrinking federal defense budget. Pursuing international opportunities.
DEFENSE SYSTEMS INTERNATIONAL DIVISION	Aggressively pursuing international opportunities.
STEEL PRODUCT DIVISION	Developing more commercial business.

INDUSTRIAL CHEMICALS	DESCRIPTION	MARKETS SERVED
ALKALI CHEMICAL DIVISION	World's largest producer of natural soda ash. Recently entered Sodium bicarbonate, caustic soda and sodium cyanide markets. One quarter of business outside United States.	Glass-making, chemicals detergents, food products, animal feed, additives, mining, air/water treatment, pulp and paper.
PEROXYGEN CHEMICALS DIVISION	Major worldwide producer of hydrogen peroxide, persulfates, perborates and other peroxygen chemicals.	Pulp and paper, textiles, chemical and polymer synthesis, environmental clean-up, electronics, detergents.
PHOSPHORUS CHEMICALS DIVISION	World's largest producer of phosphorus chemicals.	Detergents, cleaning compounds, metal treatment, food products, textiles, plastics, hydraulic fluids, pesticide intermediates, additives, pharmaceuticals.
LITHIUM DIVISION	World's largest producer of highly valued lithium-based products.	Aluminum, ceramics and glass, lubricating greases, swimming pools, textiles, aluminum alloys, batteries, rubber and plastic, air conditioning, pharceuticals.
FOREST, S.A.	Major European chemical producer. Products include hydrogen peroxide, perborate, phosphates, zeolites, silicates and sulfur derivatives,	Chemicals, detergents, pulp and paper, textiles, glass, mining, rubber, metallurgy, pharmaceuticals, tanning, ceramics, paint, food, animal feed, photography, agriculture, water treatment.

	DESCRIPTION	MARKETS SERVED
Agricultural Chemical	Produces crop protection and pest control chemicals for domestic and international markets.	Food growers, pest control markets
Food and Pharmaceutical Products Division	Largest worldwide producer of microcrystalline cellulose and cellulose gel. Produces other ingredients for food and pharmaceutical markets.	Pharmaceutical and processed food industries
Marine Colloids Division	Largest worldwide producer of carrageenan. Produces other specialty chemicals from seaweed derivatives.	Processed food industry, industrial, life science research, personal care products

INDUSTRIAL CHEMICALS	Market Position	FMC Strengths
Alkali Chemicals Division	30 percent North America	100+ years raw material supply. Low production cost. Energy self-sufficiency. Excellent distribution system.
Peroxygen Chemicals Division	30 percent North	Strong applications research. High level of service, reliability, product quality and safety. Growing capacity to meet demand.
Phosphorus Chemicals Division	30 percent North America	Low production costs. Diverse products. High level of service and reliable delivery. Strong technical support to customers.
Lithium Division	50 percent worldwide	Diverse, high value-added products. Strong manufacturing capabilities.
Foret, S.A.	Strong share in Spanish peroxygen and phosphate markets. Growing presence in European markets.	Good cost positions. Strong manufacturing capabilities. Diverse products.

PERFORMANCE CHEMICALS	MARKET POSITION	FMC STRENGTHS
Agricultural Chemical	Mid-sized international manufacturer, major pyrethroid insecticide producer	Strong insecticide portfolio. More than 50 percent of sales outside of United States.
Food and Pharmaceutical Products Division	60 percent worldwide market share for major product	Advanced applications technology. Strong manufacturing capabilities. Purity and versatility of product lines.
Marine Colloids Division	40 percent Advanced worldwide market share for major product.	Advanced applications technology. Worldwide manufacturing capabilities. Diverse products.
PRECIOUS METALS		